

CLAIMS

1. A substrate having an exterior surface bearing a hydrophilic coating that is resistant to attack by a weak acid or a weak base, the hydrophilic coating carrying a temporary protective cover that is stable in the presence of water but breaks down in the presence of a weak acid or
5 a weak base.
2. The substrate of claim 1 wherein the cover is durable to elevated temperatures on the order of about 600°C.
- 10 3. The substrate of claim 1 wherein the cover comprises a sputtered material.
4. The substrate of claim 1 wherein the cover comprises an oxide of a metal.
- 15 5. The substrate of claim 4 wherein the cover comprises an oxide of a metal selected from the group consisting of zinc, bismuth, cadmium, iron, and nickel.
6. The substrate of claim 5 wherein the cover comprises zinc oxide.
7. The substrate of claim 1 wherein the cover has a thickness of less than about 2500
20 angstroms.
8. The substrate of claim 7 wherein the cover has a thickness of less than about 100 angstroms.
- 25 9. The substrate of claim 8 wherein the cover has a thickness of between about 25 angstroms and about 60 angstroms.
10. The substrate of claim 1 wherein the cover breaks down in the presence of vinegar.
- 30 11. The substrate of claim 1 wherein the cover is formed directly upon the hydrophilic coating.
12. The substrate of claim 11 wherein the hydrophilic coating is an oxide.

13. The substrate of claim 1 wherein the hydrophilic coating has a contact angle with water of less than about 25 degrees when the cover is removed.

5 14. The substrate of claim 1 wherein the hydrophilic coating comprises sputtered silicon dioxide.

10 15. The substrate of claim 14 wherein the silicon dioxide is substantially non-porous.

16. The substrate of claim 1 wherein the hydrophilic coating is formed directly upon the substrate.

17. The substrate of claim 1 wherein the hydrophilic coating is formed upon one or more films previously deposited on the substrate.

15 18. The substrate of claim 1 wherein the hydrophilic coating is formed upon an infrared-reflective coating previously deposited on the substrate.

19. The substrate of claim 18 wherein the infrared-reflective coating comprises at least one pyrolytically-applied layer.

20 21. The substrate of claim 1 further comprising an infrared-reflective coating on an interior surface of the substrate.

25 22. The substrate of claim 20 wherein the infrared-reflective coating comprises, moving outward from the substrate, at least one dielectric layer, a metal layer, and a further dielectric layer.

30 23. An insulating glass unit comprising spaced-apart panes having confronting interior surfaces that bound a between-pane space, at least one of the panes having an exterior surface bearing a hydrophilic coating that is durable to a given washing fluid, the hydrophilic coating carrying a temporary protective cover comprising a sputtered film that protects the

hydrophilic coating against contamination but that can readily be removed from the hydrophilic coating by washing with said washing fluid.

23. The insulating glass unit of claim 22 wherein the sputtered film is stable in the

5 presence of water.

24. The insulating glass unit of claim 23 wherein said washing fluid is a mild acid or a mild base.

10 25. The insulating glass unit of claim 24 wherein said washing fluid is vinegar.

26. The insulating glass unit of claim 22 wherein said panes have been tempered.

27. The insulating glass unit of claim 22 wherein the sputtered film is durable to elevated

15 temperatures on the order of about 600°C.

28. The insulating glass unit of claim 22 wherein the sputtered film comprises an oxide of a metal.

20 29. The insulating glass unit of claim 28 wherein the sputtered film comprises an oxide of a metal selected from the group consisting of zinc, bismuth, cadmium, iron, and nickel.

30. The insulating glass unit of claim 29 wherein the sputtered film comprises zinc oxide.

25 31. The insulating glass unit of claim 22 wherein the sputtered film has a thickness of less than about 100 angstroms.

32. The insulating glass unit of claim 31 wherein the sputtered film has a thickness of between about 25 angstroms and about 60 angstroms.

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33. The insulating glass unit of claim 22 wherein the sputtered film is formed directly upon the hydrophilic coating.

34. The insulating glass unit of claim 33 wherein the hydrophilic coating is an oxide.

35. The insulating glass unit of claim 22 wherein the hydrophilic coating has a contact angle with water of less than about 25 degrees when the cover is removed.

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36. The insulating glass unit of claim 22 wherein at least one of said confronting interior surfaces bears an infrared-reflective coating.

37. The insulating glass unit of claim 36 wherein the infrared-reflective coating 10 comprises, moving outwardly from the substrate, at least one dielectric layer, a metal layer, and a further dielectric layer.

38. A substrate bearing a hydrophilic coating comprising silicon dioxide formed directly upon the substrate, the hydrophilic coating being durable to a given washing fluid, the 15 hydrophilic coating carrying a temporary protective cover comprising a sputtered film that protects the hydrophilic coating against contamination but that can readily be removed from the hydrophilic coating by washing with said washing fluid.

39. The substrate of claim 38 wherein the sputtered film comprises an oxide of a metal.

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40. The substrate of claim 39 wherein the sputtered film comprises an oxide of a metal selected from the group consisting of zinc, bismuth, cadmium, iron, and nickel.

41. The substrate of claim 40 wherein the sputtered film comprises zinc oxide.

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42. A method of producing substrates, the method comprising:

- a) providing a substrate with generally opposed interior and exterior surfaces;
- b) forming a hydrophilic coating upon the exterior surface of the substrate, the hydrophilic coating comprising material that is resistant to attack by a weak acid or a weak base; and
- c) forming a temporary protective cover over the hydrophilic coating, the cover comprising material that is stable in the presence of water but breaks down in the presence of a weak acid or a weak base.

43. The method of claim 42 wherein the hydrophilic coating is formed by sputtering silicon dioxide upon the exterior surface of the substrate.

5 44. The method of claim 42 wherein the cover is formed by sputtering upon the hydrophilic coating an oxide of a metal selected from the group consisting of zinc, bismuth, cadmium, iron, and nickel.

10 45. The method of claim 42 wherein the cover is durable to elevated temperatures on the order of about 600°C, the method further comprising tempering the covered substrate.

46. The method of claim 42 further comprising incorporating the covered substrate into an insulating glass unit.

15 47. The method of claim 42 further comprising delivering the covered substrate to a customer.

48. The method of claim 42 further comprising installing the covered substrate in a window frame.

20 49. A method of processing substrates, the method comprising:
a) providing a substrate having an exterior surface bearing a hydrophilic coating that is durable to a given washing fluid, the hydrophilic coating carrying a temporary protective cover comprising a sputtered film that protects the hydrophilic coating against 25 contamination but that can readily be removed from the hydrophilic coating by washing with said washing fluid; and

b) washing the covered exterior surface of the substrate with said washing fluid to remove at least a portion of the cover, thereby exposing at least a portion of the hydrophilic coating.

30 50. The method of claim 49 wherein said washing fluid comprises a mild acid or a mild base.

51. The method of claim 50 wherein said washing fluid comprises vinegar.

52. The method of claim 49 wherein said washing removes substantially the entire cover.

5 53. The method of claim 52 further comprising incorporating the covered substrate into an insulating glass unit prior to said washing step.

54. The method of claim 52 further comprising delivering the covered substrate to a customer prior to said washing step.

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55. The method of claim 52 further comprising installing the covered substrate in a window frame prior to said washing step.

15 56. The method of claim 49 wherein the cover is durable to elevated temperatures on the order of about 600°C, the method further comprising tempering the covered substrate.